

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPELLANTS :	HELEN O'HARA, ET AL.	CONFIRMATION No.:	3549
SERIAL NUMBER :	09/938,649	EXAMINER:	FELTON, AILEEN
FILING DATE :	AUGUST 27, 2001	ART UNIT:	1793
FOR :	GASSER COMPOSITION AND METHOD OF GASSING		

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**APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 41.37(d)**

**Mail Stop Appeal Brief - Patents**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In response to the Notice of Non-Compliant Appeal Brief mailed April 13, 2009, Appellant submits this Supplemental Appeal Brief under 37 C.F.R. § 41.37(d).

This Appeal is from a Final Rejection mailed April 11, 2008, rejecting claims 60-78 of the above-identified patent application. This brief is in furtherance of the Notice of Appeal and Pre-Appeal Brief Request both filed October 10, 2008. The Panel Decision from the Pre-Appeal Brief Review, mailed December 3, 2008, indicated that the application remains under appeal because there is at least one issue for appeal.

The Director is authorized to charge the \$510.00 fee for filing an Appeal Brief pursuant to 37 C.F.R. § 41.20(b)(2), as well as any additional fees that may be due, or credit any overpayment of same, to Deposit Account No. **033975 (Ref. No. 021058-0257402)**.

**APPEAL BRIEF UNDER 37 C.F.R. § 41.37**

**I. 37 C.F.R. § 41.37(c)(1)(i) - REAL PARTY IN INTEREST**

The real party in interest for this Appeal and the present application is ORICA AUSTRALIA PTY LTD., by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel/Frame 012122/0371.

**II. 37 C.F.R. § 41.37(c)(1)(ii) - RELATED APPEALS AND INTERFERENCES**

Appellant is not aware of any related appeals and/or interferences.

**III. 37 C.F.R. § 41.37(c)(1)(iii) - STATUS OF CLAIMS**

Pending: Claims 60-78 are pending.

Cancelled: Claims 1-59 have been cancelled.

Rejected: Claims 60-78 stand rejected.

Allowed: No claims have been allowed.

On Appeal: The rejection of claims 60-78 is appealed.

**IV. 37 C.F.R. § 41.37(c)(1)(iv) - STATUS OF AMENDMENTS**

A Final Rejection was mailed on April 11, 2008 (hereafter "Office Action"). No amendments have been filed after the Office Action.

**V. 37 C.F.R. § 41.37(c)(1)(v) - SUMMARY OF CLAIMED SUBJECT MATTER**

The following explanation of the claimed subject matter, with reference to the specification, is for explanation only and is not to be construed, in any way, as an

admission that the claims are limited to the particularly disclosed embodiments. Rather, such description is intended to facilitate an understanding of the claims by the Board and is absolutely not intended to operate to limit the claims in any way. The invention is not limited to the disclosed embodiments.

Reference, below, is made to the originally-filed Specification filed on August 27, 2001, unless otherwise indicated.

**A. INDEPENDENT CLAIM 60**

Claim 60 concerns a method of forming a gassed emulsion explosive composition. [see generally page 5, lines 13-27]. The method includes, among other things, steps (a) – (c).

Step (a): Claim 60 includes forming a gasser solution comprising a solution of an inorganic nitrite, an ammonium species and optionally an accelerator. [see, e.g., page 8, line 1 – page 9, line 31; see also Examples 1-23].

Step (b): Claim 60 includes adding the gasser solution to an emulsion explosive composition having a discontinuous aqueous phase comprising inorganic oxygen releasing salts, a continuous water immiscible organic phase and a poly[alk(en)yl] succinic anhydride based emulsifier such that droplets of gasser composition are distributed throughout the emulsion explosive composition. [see, e.g., page 9, line 33 – page 13, line 19].

Step: (c) Claim 60 includes allowing the inorganic nitrite and the ammonium species of the gasser solution to react and form gas which is distributed as bubbles throughout the emulsion to form the gassed emulsion explosive composition. [see, e.g., page 7, lines 8-14].

Claim 60 further recites that the gasser solution is formed during or immediately before addition of the gasser solution to the emulsion explosive composition by mixing the inorganic nitrite, ammonium species and optionally the accelerator. [see, e.g., page 10, lines 29-33]. Moreover, the reaction between the inorganic nitrite and the ammonium species occurs within droplets of the gasser solution such that there is substantially no chemical attack on the emulsifier. [see, e.g., page 5, lines 13-27].

**B. DEPENDENT CLAIMS 61-67, 70, 72, 74-76**

Claims 61-67, 70, 72, 74-76 do not include means-plus-function recitations as permitted by 35 U.S.C. § 112, sixth paragraph.

**VI. 37 C.F.R. § 41.37(c)(1)(vi) – GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

Claims 60-78 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,076,867 to McKenzie ("McKenzie").

Thus, the ground of rejection to be reviewed on appeal is:

A. Whether claims 60-78 are patentable over McKenzie.

**VII. 37 C.F.R. § 41.37(c)(1)(vii) – ARGUMENT**

**A. Claims 60-78 are patentable over McKenzie.**

Appellant submits that claims 60-78 are novel and non-obvious over McKenzie under 35 U.S.C. §§ 102-103.

Under 35 U.S.C. § 102, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, "... unless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102." *Net Money/IN, Inc. v. VeriSign, Inc. et al.*, Slip Op. pg. 17-18 (Fed. Cir., October 20, 2008).

To establish a *prima facie* case of obvious under 35 U.S.C. § 103, the Office must make a determination that the claimed invention "as a whole" would have been obvious a person of ordinary skill in the art at the time the invention was made. The mere fact that the reference can be modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art. *KSR International Co. v. Teleflex Inc.*, 550 U.S. \_\_\_, \_\_\_, 82 USPQ2d 1385, 1396 (2007). The pertinent inquiry is whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* To facilitate review, this analysis should be made explicit. *Id.* citing *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness").

**I. McKenzie does not teach or suggest forming a gasser solution comprising a solution of an inorganic nitrite, an ammonium species and optionally an accelerator ... wherein the**

**gasser solution is formed during or immediately before addition of the gasser solution to the emulsion explosive composition by mixing the inorganic nitrite, ammonium species and optionally the accelerator.**

Claim 60 recites (a) forming a gasser solution comprising a solution of an inorganic nitrite, an ammonium species and optionally an accelerator; and (b) adding the gasser solution (which solution includes the inorganic nitrite, the ammonium species and optionally the accelerator) to an emulsion explosive composition having a discontinuous aqueous phase comprising inorganic oxygen releasing salts, a continuous water immiscible organic phase and a poly[alk(en)yl succinic anhydride based emulsifier. Further, claim 60 recites that the gasser solution is formed during or immediately before addition of the gasser solution to the emulsion explosive composition by mixing the inorganic nitrite, ammonium species and optionally the accelerator.

The Office Action asserts that "McKenzie discloses a water-in-oil emulsion that is formed by mixing nitrite, oxidizer salt, and thiourea and subsequently adding this solution to the emulsifier and the fuel (see col. 4, lines 30-68)." [Office Action, page 2]. Appellant disagrees with this assertion for *at least* the reason that the Office Action has mischaracterized McKenzie.

McKenzie does not teach or suggest the claimed gasser solution. For example, column 4, lines 30-68 of McKenzie describes "conventional" ways in which emulsions may be gassed in order to sensitise them: (1) chemical gassing; and (2) the inclusion of physical gassing agents as hollow spheres or particles.

In relation to chemical gassing, McKenzie discloses that this involves adding sodium nitrite to an emulsion that already contains a gassing accelerator, such as

thiourea, in the oxidiser phase. Indeed, column 4, lines 36-39 of McKenzie clearly states that:

A sodium nitrite/thiourea combination begins producing gas bubbles immediately upon addition of the nitrite to the oxidizer solution containing the thiourea...

[Emphasis added].

Thus, McKenzie does not disclose mixing nitrite, oxidiser salt and thiourea, and adding this solution to emulsifier and fuel, as claim 60 requires. Rather, McKenzie discloses forming an emulsion comprising an oxidiser salt and fuel in which thiourea is contained within the oxidiser phase. This emulsion, containing thiourea, is then gassed when sodium nitrite is added.

Accordingly, not only does McKenzie not anticipate claim 60, but its teachings are inapposite to the claimed invention.<sup>1</sup> In fact, Appellant's Specification specifically discusses the drawbacks of the above sequence of steps. Specifically, Appellant discloses that the "[s]eparate addition of the inorganic nitrite and the ammonium species directly to the emulsion explosives composition does not provide the advantages of the invention which lie in efficient gassing rates and the reduction of [sic] elimination of the problem of emulsion breakdown experiences using nitrite as the chemical gassing agent." [Appellant's Specification, page 9, lines 26-31]. For at least this reason, claim 60 is not rendered obvious by McKenzie, either.

McKenzie also discloses physical gassing using hollow spheres or particles (microballoons). [See McKenzie, col. 4, lines 46-51]. However, gassing in the claimed invention takes place by a chemical approach,<sup>2</sup> rather than by a physical

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<sup>1</sup> "[W]hen the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious." KSR, 550 U.S. at \_\_\_\_; 82 USPQ2d at 1395 (citing *U.S. v. Adams*, 383 U.S. 39, 51-52 (1966)).

<sup>2</sup> Claim 60 recites "allowing the inorganic nitrite and the ammonium species of the gasser solution to react and form gas..." (emphasis added).

gassing approach. Accordingly, these teachings of McKenzie are not relevant to claim 60.

- II. McKenzie does not teach or suggest adding the gasser solution to an emulsion explosive composition having a discontinuous aqueous phase comprising inorganic oxygen releasing salts, a continuous water immiscible organic phase and a poly[alk(en)yl] succinic anhydride based emulsifier such that droplets of gasser composition are distributed throughout the emulsion explosive composition.**

Claim 60 recites "(b) adding the gasser solution to an emulsion explosive composition having a discontinuous aqueous phase comprising inorganic oxygen releasing salts, a continuous water immiscible organic phase and a poly[alk(en)yl] succinic anhydride based emulsifier such that droplets of gasser composition are distributed throughout the emulsion explosive composition."

The Office Action alleges that McKenzie teaches the use of PIBSA as surfactant, and alleges that this PIBSA is the same as the emulsifier referred to in step (b) of claim 60 of the present application. [See Office Action, page 2-3]. Appellant respectfully disagrees for at least the reason that in McKenzie, the PIBSA is a surfactant that is added to ammonium nitrate (AN) or the fuel component of ammonium nitrate fuel oil (ANFO) rather than being the surfactant that is used to form the emulsion. [See McKenzie, col. 2, lines 24-31].

In fact, McKenzie is directed to solving a different problem, i.e., the inherent instability of emulsion explosives based on emulsion and AN or ANFO prills. [See McKenzie, col. 1, line 49 – col. 2, line 8]. If the emulsion is weakened or becomes unstable, crystallisation or solidification of droplets result. [See McKenzie, col. 1, lines 56-61]. The addition of solid components, such as AN or ANFO prills, to emulsion explosives, tends to result in additional destabilization. [See McKenzie, col.



1, lines 61-66]. Thus, the aim of McKenzie is to enhance the stability of emulsion explosive compositions that contain AN or ANFO prills. [McKenzie, col. 2, lines 9-19]. This is achieved by addition of a surfactant to the AN prills or dissolution of a surfactant in the liquid organic fuel of ANFO prills prior to addition of the liquid fuel to the prills (in order to form ANFO prills). [See McKenzie, col. 3, lines 15-30].

Indeed, McKenzie states that "... it has been found that use of a surfactant in this manner imparts greatly increased stability to the resulting emulsion and AN or ANFO prills mixture. By 'stability' is meant that the emulsion phase of the emulsion and AN or ANFO prills mixture remains a stable emulsion, i.e., does not appreciably break down or experience crystallization of the discontinuous oxidising salt phase over a given period of time." [McKenzie, Col. 1, lines 32-39]. Thus, the surfactant disclosed in McKenzie is not the same as a surfactant used to form the emulsion itself. And, while McKenzie does refer to the use of PIBSA surfactants, it is only in the context of addition to AN prills or dissolution of surfactant in the liquid organic fuel of ANFO prills prior to addition of the liquid fuel component to the AN prills. [See McKenzie, col. 3, lines 9-10].

McKenzie does teach formation of a water-in-oil emulsion using a *conventional emulsifier* (sometimes known as a surfactant). However, McKenzie is silent as to the use of poly[alk(en)yl] succinic anhydride based emulsifier, as claim 60 recites. [Cf. McKenzie, col. 3, line 31 – col. 4, line 32]. Rather, as discussed above, the PIBSA surfactant discussed in McKenzie is the surfactant that is added to the prills and not a surfactant/emulsifier that is used in the forming the water-in-oil emulsion.

Accordingly, claim 60 is neither anticipated nor rendered obvious by McKenzie.

- III. McKenzie does not teach or suggest allowing the inorganic nitrite and the ammonium species of the gasser solution to react and form gas which is distributed as bubbles throughout the emulsion to form the gassed emulsion explosive composition ... wherein the reaction between the inorganic nitrite and the ammonium species occurs within droplets of the gasser solution such that there is substantially no chemical attack on the emulsifier.**

Claim 60 recites "(c) allowing the inorganic nitrite and the ammonium species of the gasser solution to react and form gas which is distributed as bubbles throughout the emulsion to form the gassed emulsion explosive composition." Further, claim 60 recites "wherein the reaction between the inorganic nitrite and the ammonium species occurs within droplets of the gasser solution such that there is substantially no chemical attack on the emulsifier."

In contrast to McKenzie, the claimed invention is directed to a particular problem associated with chemical gassing of emulsions that are formulated using a poly[alk(en)yl] succinic anhydride based emulsifier. For example, one of the problems associated with the use of nitrite gassing agents is that nitroso species are generated during the gassing reaction and these may react with functional moieties on the headgroup of the emulsifier used to produce the emulsion. [See Appellant's Specification, page 3, line 27 – page 4, line 10]. Reaction between the nitroso species and the emulsifier causes chemical changes in the emulsifier and this can have a damaging effect on the emulsifying capability of the emulsifier, subsequently leading to breakdown of the emulsion into discreet aqueous and oil phases [See Appellant's Specification, page 3, line 27 – page 4, line 10]. The claimed invention specifically addresses this problem by formulating a gassing solution comprising inorganic nitrate, ammonium species and optionally an accelerator. This gassing solution is formed during or immediately before addition to the emulsions and the

chemical gassing reaction that takes place occurs within droplets of the gasser solution within the emulsion, such that there is substantially no chemical attack on the emulsifier.

McKenzie, by contrast, does not teach or provide any solutions addressing this problem.

In addition, the Office Action alleges that the order of steps of the addition of the gasser solution to the emulsion explosive is obvious. [See Office Action, page 3]. However, the order of steps as claimed, provides new and unexpected results over McKenzie. To be sure, the order of steps may be patentable where the steps provide new and unexpected results over the prior art. See KSR, 550 U.S. at \_\_\_\_; 82 USPQ2d at 1396; *see also In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946). Here, the gasser solution is formed during or immediately before addition to the emulsions and the chemical gassing reaction that takes place occurs within droplets of the gasser solution within the emulsion, such that there is substantially no chemical attack on the emulsifier. Thus, claim 60 is neither anticipated nor rendered obvious by McKenzie.

The Office Action also alleges that "... the amounts of each component are indicated in col. 2 and 3. Col. 4, lines 44-50 of McKenzie also indicates that microballoons can be used in addition to the thiourea/nitrite combination." [Office Action, page 2]. These points are not relevant to the claimed invention. For example, the amounts disclosed at column 3, lines 15-30 of McKenzie are the amounts of surfactant added to the AN prills or to the fuel portion of ANFO prills – not the claimed gasser solution. Column 3, lines 31-61 of McKenzie also discuss formation of a conventional emulsion explosive. However, the claims do not recite such compositions *per se*. Rather, claim 60 specifically recites process steps.

\* \* \*

For *at least* the foregoing reasons, claim 60 is neither taught nor otherwise rendered obvious by McKenzie. Dependent claims 61-78 depend from claim 60 and are patentable over McKenzie for the same reasons as claim 60 and for the additional features they recite individually.

II. Claim 61

Claim 61 further recites that the emulsifier is a polyisobutylene succinic anhydride based emulsifier (PIBSA).

As discussed above, the PIBSA surfactant discussed in McKenzie is a surfactant that is added to ammonium nitrate (AN) or the fuel component of ammonium nitrate fuel oil (ANFO) is the surfactant that is added to the prills and not an emulsifier that is used in the forming the water-in-oil emulsion. [See McKenzie, col. 2, lines 24-31].

Accordingly, claim 61 is neither taught nor otherwise rendered obvious by McKenzie.

III. Claims 62-67, 70, 72 and 74-76

In addition, the Office Action asserts that "... it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the parameters of the emulsion such as pH, amounts and density to achieve a desired result." [Office Action, page 2]. Appellant respectfully disagree.

As discussed above, McKenzie does not teach or suggest the claimed gasser solution, nor the claimed emulsifier. Thus, variation in parameters such as pH, amounts and density are merely incidental and do not address the above

shortcomings, particularly when one considers the differences between McKenzie and the claimed invention "as a whole" under 35 U.S.C. § 103. Indeed, a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). The Office Action, however, has not made (and cannot make) such a showing.

Accordingly, claims 62-67, 70, 72 and 74-76 are neither anticipated nor rendered obvious by McKenzie.

**VIII. 37 C.F.R. § 41.37(c)(1)(viii) – CLAIM APPENDIX**

**Appendix A:** The pending claims (claims 60-78) are attached in Appendix A.

**IX. 37 C.F.R. § 41.37(c)(1)(ix) – EVIDENCE APPENDIX**

**Appendix B:** (None)

**IX. 37 C.F.R. § 41.37(c)(1)(x) – RELATED PROCEEDINGS INDEX**

**Appendix C:** (None)

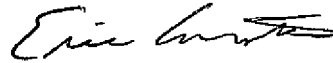
CONCLUSION

For at least the foregoing reasons, Appellants respectfully requests that the Honorable Board reverse the rejection of pending claims 60-78.

Date: May 13, 2009

Respectfully submitted,

By:



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APPENDIX A

**CLAIMS**

1. – 59. (Cancelled)

60. (Previously Presented) A method of forming a gassed emulsion explosive composition comprising:

(a) forming a gasser solution comprising a solution of an inorganic nitrite, an ammonium species and optionally an accelerator;

(b) adding the gasser solution to an emulsion explosive composition having a discontinuous aqueous phase comprising inorganic oxygen releasing salts, a continuous water immiscible organic phase and a poly[alk(en)yl] succinic anhydride based emulsifier such that droplets of gasser composition are distributed throughout the emulsion explosive composition; and

(c) allowing the inorganic nitrite and the ammonium species of the gasser solution to react and form gas which is distributed as bubbles throughout the emulsion to form the gassed emulsion explosive composition;

wherein the gasser solution is formed during or immediately before addition of the gasser solution to the emulsion explosive composition by mixing the inorganic nitrite, ammonium species and optionally the accelerator, and wherein the reaction between the inorganic nitrite and the ammonium species occurs within droplets of the gasser solution such that there is substantially no chemical attack on the emulsifier.

61. (Previously Presented) A method according to claim 60, wherein the emulsifier is a polyisobutylene succinic anhydride based emulsifier.

62. (Previously Presented) A method according to claim 60, wherein the gasser solution has a pH between pH 5 and pH 9.

63. (Previously Presented) A method according to claim 62, wherein the gasser solution has a pH between pH 6 and pH 8.

64. (Previously Presented) A method according to claim 60 , wherein in forming the gasser solution, the ratio of inorganic nitrite to ammonium species is between 10:1 and 1:10.

65. (Previously Presented) A method according to claim 60, wherein in forming the gasser solution, the molar proportion of ammonium species is up to 10% greater than the molar proportion of inorganic nitrite.

66. (Previously Presented) A method according to claim 60 , wherein in forming the gasser solution, the ammonium species and inorganic nitrite are present in equimolar quantities.

67. (Previously Presented) A method according to claim 60, wherein in forming the gasser solution, the ammonium species and inorganic nitrite are present in equimolar quantities and the gasser solution pH is between pH 5 and pH 9.

68. (Previously Presented) A method according to claim 60, wherein the ammonium species is selected from the group consisting of ammonium chloride, ammonium nitrate, ammonium chlorate, ammonium perchlorate and combinations thereof.

69. (Previously Presented) A method according to claim 60, wherein the ammonium species is formed in situ in the gasser composition.

70. (Previously Presented) A method according to claim 60, wherein the ammonium species comprises up to 25 wt.% of the gasser solution.

71. (Previously Presented) A method according to claim 60, wherein the inorganic nitrite is selected from the group consisting of alkaline earth nitrites, alkali metal nitrites and combinations thereof.

72. (Previously Presented) A method according to claim 60, wherein the inorganic nitrite comprises up to 25 wt.% of the gasser solution.



73. (Previously Presented) A method according to claim 60, wherein the gasser solution comprises an accelerator selected from the group consisting of thiourea, thiocyanate, iodide, cyanate, acetate and combinations thereof.

74. (Previously Presented) A method according to claim 60 , wherein the accelerator comprises up to 25 wt.% of the gasser solution.

75. (Previously Presented) A method according to claim 60, wherein the gassed emulsion explosive composition has a density of less than 1.0 g/cc.

76. (Previously Presented) A method according to claim 75 , wherein the gassed emulsion explosive composition has a density of less than 0.8 g/cc.

77. (Previously Presented) A method according to claim 60, which additionally comprises adding to the emulsion explosive composition a closed cell void material selected from the group consisting of glass microballoons, plastic microballoons and mixtures thereof.

78. (Previously Presented) A method according to claim 60, wherein the emulsifier comprises a primary amine, secondary amine, amide, carboxylic acid, ester or anhydride group.

**APPENDIX B**

**EVIDENCE APPENDIX**

NONE

**APPENDIX C**

**RELATED PROCEEDINGS INDEX**

NONE